UNITED STATES PATENT AND TRADEMARK OFFICE

Sr

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/685,084	10/14/2003	John Oskin	30451/94753	4333

23644 7590 03/31/2005

BARNES & THORNBURG
P.O. BOX 2786
CHICAGO, IL 60690-2786

EXAMINER
WACHSMAN, HAL D

ART UNIT	PAPER NUMBER
2857	

DATE MAILED: 03/31/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	**Application No.** 10/685,084	**Applicant(s)** OSKIN ET AL.	
	Examiner Hal D. Wachsman	**Art Unit** 2857	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *30 December 2004*.
2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.
3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,8,10-12,15 and 21* is/are pending in the application.
4a) Of the above claim(s) _____ is/are withdrawn from consideration.
5)☐ Claim(s) _____ is/are allowed.
6)☒ Claim(s) *1,8,10-12,15 and 21* is/are rejected.
7)☐ Claim(s) _____ is/are objected to.
8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.
10)☒ The drawing(s) filed on *30 December 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a)☐ All b)☐ Some * c)☐ None of:
1.☐ Certified copies of the priority documents have been received.
2.☐ Certified copies of the priority documents have been received in Application No. _____.
3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

1. Claims 1, 8, 10-12 and 15 are improper under 37 C.F.R. 1.121 because in each of these claims a single brackets instead of a double brackets was used to delete text of the claim. Appropriate correction is required.

2. Claims 8 and 10-12 are objected to under 37 C.F.R. 1.75(a) for failing to particularly point out and distinctly claim the subject matter which the applicant regards as the invention. All the claims that depend from claim 1 refer to "The method of claim 1..". However, as a result of the amendment made to the preamble of claim 1, this should now be "The computer-aided method of claim 1...". While the examiner understands the intentions of the applicant here he feels confusion could be drawn from the preamble differences noted above. Appropriate correction is required.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

4. Claims 1, 8, 10-12 and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over "Managing overall equipment effectiveness [OEE] to optimize factory performance" (Pomorksi) in view of "Manufacturing science in ion implantation" (Glawischnig), the Applicant's Admissions of the prior art and "300 mm tool automation and its impact on fab design and OEE" (Weiss).

As per claim 1, Pomorski (page A-33) discloses "calculating an availability value for the equipment", "calculating a performance value for the equipment", "calculating a quality erosion value for the equipment" and "defining an overall equipment effectiveness value for the equipment as the product of the availability value, the performance value, and the quality erosion value". Pomorski (page A-34) discloses "calculating a performance loss value for the equipment" and "calculating a quality loss value for the equipment". It appears though that Pomorksi does not clearly disclose the remaining features of this claim. However, Glawischnig (page 354, see at least figure 1) teaches "displaying the overall equipment effectiveness value, the performance loss value, and the quality loss value in a graphical format display". It would have been obvious to a person of ordinary skill in the art at the time the invention was made to apply the techniques of Glawischnig to the invention of Pomorski as specified above because as taught by Glawischnig (page 354, section II.A.) all semiconductor manufacturing sites use some kind of documentation of the actual equipment performance as a means for controlling and planning. The stati of the equipment are usually segmented according to SEMI standards as seen in Figure 1 in Glawischnig. It appears though that the above combination of references still does not clearly disclose "improving operational efficiency by having an operator view the graphical format display and having the operator take corrective action based on the graphical format display to improve the overall equipment effectiveness value." However, with respect to the "improving operational efficiency by having an operator view the graphical format display" the Applicant's Admissions of the prior art (paragraph 0003 lines 3-7) teach that *displays showing the OEE value along with OEE-determining variables are often shown on a display positioned along side the equipment*. Such placement allows both **an operator** and management to gauge efficiency on-site as well as **allowing improvements** and declines in productivity to be readily measured and identified. Consequently, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to apply the Applicant's Admissions of the prior art to the inventions of Pomorksi and Glawischnig as specified above because the viewing of the graphical format display by the operator would enable the operator as well as management to gauge the OEE and allow improvements and declines in the overall equipment effectiveness to be readily measured and identified. It appears though that the above combination of references still does not explicitly disclose "having the operator take corrective action based on the graphical format display to improve the overall equipment effectiveness value". However, Weiss in figure 1 teaches the displaying of historical OEE and in figure 3 teaches the displaying of OEE elements under fab control and beneath this figure in the section entitled "Improving OFE" states "Therefore, without any change to tool performance, the fab **operator/**designer can improve the OFE by optimizing the factors which affect: tool idle time, setup time, and wafer manipulation times." (Note: OFE, the Overall Fab Effectiveness is the *OEE* of the total fab (see Abstract of Weiss)). Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to apply the techniques of Weiss to the inventions of Pomorksi and Glawischnig as well as the Applicant's Admissions of the prior art as specified above because Glawischnig (page 358) in overall performance improvement strategies (see Table IV) for improving OEE, divides the performance improvement strategies in the four major segments of a production system, namely equipment, work in progress, process availability and **operator**, in which actions associated with an operator that affect OEE are identified.

As per claim 8, Glawischnig (page 358) teaches the feature of this claim. It would have been obvious to a person of ordinary skill in the art at the time the invention was made to apply the techniques of Glawischnig to the inventions of Pomorski and Weiss as well as the Applicant's Admissions of the prior art as specified above because by reducing the duration of a break the downtime is also reduced.

As per claim 10, Glawischnig (pages 358, 359) teaches the feature of this claim. It would have been obvious to a person of ordinary skill in the art at the time the invention was made to apply the techniques of Glawischnig to the inventions of Pomorski and Weiss as well as the Applicant's Admissions of the prior art as specified above because by reducing delays due to shift transitions the downtime is also reduced.

As per claim 11, the feature of this claim has already been addressed in the rejection of claim 1 above with the exception of the rewarding of an operator. However, it is inherent in the art that rewards to employees, such as in this case an operator, provide added incentive to meet the desired performance goals.

As per claim 12, the Applicant's Admissions of the prior art (paragraph 0003 lines 3-7) teach that *displays showing the OEE value along with OEE-determining variables are often shown on a display positioned along side the equipment.* Such placement allows both **an operator** and management to gauge efficiency on-site as well as **allowing improvements** and declines in productivity to be readily measured and identified. Consequently, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to apply the Applicant's Admissions of the prior art to the inventions of Pomorksi, Glawischnig and Weiss as specified above because the viewing of the graphical format display by the operator would enable the operator as well as management to gauge the OEE and allow improvements and declines in the overall equipment effectiveness to be readily measured and identified.

As per claim 21, Pomorski (page A-33) discloses "calculating an availability value for the equipment", "calculating a performance value for the equipment", "calculating a quality erosion value for the equipment" and "defining an overall equipment effectiveness value for the equipment as the product of the availability value, the performance value, and the quality erosion value". Pomorski (page A-34) discloses "calculating a performance loss value for the equipment" and "calculating a quality loss value for the equipment". It appears though that Pomorksi does not clearly disclose the remaining features of this claim. However, Glawischnig (page 354, see at least figure 1) teaches "displaying the overall equipment effectiveness value, the performance loss value, and the quality loss value as a plurality of wedges in a pie chart". It would have been obvious to a person of ordinary skill in the art at the time the invention was made to apply the techniques of Glawischnig to the invention of Pomorski as specified above because as taught by Glawischnig (page 354, section II.A.) all semiconductor manufacturing sites use some kind of documentation of the actual equipment performance as a means for controlling and planning. The stati of the equipment are usually segmented according to SEMI standards as seen in Figure 1 in Glawischnig. It appears though that the above combination of references still does not clearly disclose "improving operational efficiency by having an operator view the pie chart and having the operator take corrective action that will increase the size of the wedge corresponding to the overall equipment effectiveness value or decrease the size of at least one of the wedges corresponding to values other than the overall equipment effectiveness value". However, with respect to the "improving operational efficiency by having an operator view the pie chart" the Applicant's Admissions of the prior art (paragraph 0003 lines 3-7) teaches that *displays showing the OEE value along with OEE-determining variables are often shown on a display positioned along side the equipment.* Such placement allows both **an operator** and management to gauge efficiency on-site as well as **allowing improvements** and declines in productivity to be readily measured and identified. Consequently, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to apply the Applicant's

Admissions of the prior art to the inventions of Pomorksi and Glawischnig as specified above because the viewing of the pie chart by the operator would enable the operator as well as management to gauge the OEE and allow improvements and declines in the overall equipment effectiveness to be readily measured and identified. It appears though that the above combination of references still does not explicitly disclose "having the operator take corrective action that will increase the size of the wedge corresponding to the overall equipment effectiveness value or decrease the size of at least one of the wedges corresponding to values other than the overall equipment effectiveness value". However, Weiss in figure 1 teaches the displaying of historical OEE and in figure 3 teaches the displaying of OEE elements under fab control and beneath this figure in the section entitled "Improving OFE" states "Therefore, without any change to tool performance, the fab **operator/**designer can improve the OFE by optimizing the factors which affect: tool idle time, setup time, and wafer manipulation times." (Note: OFE, the Overall Fab Effectiveness is the *OEE* of the total fab (see Abstract of Weiss)). Thus, for example in Figure 3 of Weiss there is a tool idle time wedge of "Idle no Operator" in which if the tool idle time was optimized by minimizing the time that there is no operator, the resulting reduction in idle time would decrease the size of the "Idle no Operator" wedge which is a wedge that corresponds to values other than the overall equipment effectiveness value. In addition, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to apply the techniques of Weiss to the inventions of Pomorksi and Glawischnig as well as the Applicant's Admissions of the prior art as specified above because Glawischnig (page

358) in overall performance improvement strategies (see Table IV) for improving OEE, divides the performance improvement strategies in the four major segments of a production system, namely equipment, work in progress, process availability and **operator** in which actions associated with an operator that affect OEE are identified.

5. Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over Wu et al. (6,256,550) in view of "Manufacturing Science in Ion Implantation" (Glawischnig).

As per claim 15, Wu et al. (figures 2, 5-7, col. 1 lines 43-50, col. 4 lines 51-67, col. 5 lines 1-14, 65-67) disclose "a general purpose computer, the general purpose computer being loaded with a software module containing instructions for calculating one or more values related to overall equipment effectiveness for at least one equipment of the plurality of equipment". Wu et al. (figures 2, 5-7, col. 7 lines 40-64) disclose "a plurality of terminals in networked communication with the general purpose computer....displaying at least the overall equipment effectiveness value, the performance loss value, and the quality loss value in a graphical format display" but does not clearly disclose the graphical format display being a pie chart. However, Glawischnig (page 354, see at least figure 1) teaches this excepted feature. It would have been obvious to a person of ordinary skill in the art at the time the invention was made to apply the techniques of Glawischnig to the invention of Wu et al. because as taught by Glawischnig (page 354, section II.A.) all semiconductor manufacturing sites use some kind of documentation of the actual equipment performance as a means for controlling and planning. The stati of the equipment are usually segmented according to SEMI standards as seen in Figure 1 in Glawischnig.

6. Applicant's arguments with respect to claims 1, 8, 10-12, 15 and 21 have been considered but are moot in view of the new ground(s) of rejection. The Examiner does respectfully note though with respect to the argument concerning the combination of the Wu et al. and Glawischnig references in claim 15 that the motivation for this was provided in the rejection of claim 15 and as shown above found in the Glawischnig reference.

7. No claims are allowed.

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Hal D. Wachsman whose telephone number is 571-272-2225. The examiner can normally be reached on Monday to Friday 7:00 A.M. to 4:30 P.M..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Marc Hoff can be reached on 571-272-2216. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only.

For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Hal D. Wachsman
Hal D Wachsman
Primary Examiner
Art Unit 2857

HW
March 25, 2005